

Claims

- 1 1. A disc shaped padlock comprising:
 - 2 a disc shaped body member forming an external notch extending radially
 - 3 through the circumference of said disc shaped body member and having a width
 - 4 sufficient to receive elements to be locked;
 - 5 an internal groove formed at the circumference of said body member;
 - 6 a shackle disposed in said groove of said body member, said shackle being
 - 7 in the form of an open ring having a gap at least equal to the width of said external notch,
 - 8 said shackle being in an unlocked position when said gap and said notch are aligned and
 - 9 in a locked position when said shackle has a portion closing the open end of said external
 - 10 notch; and
 - 11 anti-friction bearings positioned in the surface of said shackle for
 - 12 engagement with the surface of said internal groove to limit transverse movement of said
 - 13 shackle relative to the internal surface of said internal groove during arcuate movement
 - 14 of said shackle between locked and unlocked positions.
- 1 2. The disc shaped padlock of claim 1 wherein said anti-friction bearings remain
- 2 within said body member during movement between said locked and unlocked positions
- 3 of said shackle.

1 3. The disc shaped padlock of claim 2 wherein a first bearing is positioned
2 adjacent one end of said gap in said shackle and a second bearing is spaced from the
3 other end of said gap in said shackle a distance more than the width of said external notch
4 in said body member.

1 4. The disc shaped padlock of claim 2 wherein a first bearing is positioned in said
2 shackle adjacent one end of said gap and a second bearing is positioned in said shackle
3 diametrically opposed from said first bearing.

1 5. The disc shaped padlock of claim 2 wherein said anti-friction bearings are ball
2 bearings.

1 6. The disc shaped padlock of claim 2 wherein each of said anti-friction bearings
2 are ball bearings disposed in pairs with each bearing of each pair being disposed in the
3 radially outer circumferential surface of said shackle to engage the surface of said
4 internal groove and limit movement of said shackle relative to said groove.

1 7. The disc shaped padlock of claim 4 wherein a lock-engaging notch is formed
2 in said shackle diametrically opposite said gap in said shackle.

1 8. The disc shaped padlock of claim 1 wherein said gap in said shackle is
2 disposed between ends of said shackle and wherein both of said ends are within said body
3 member in said locked and unlocked positions of said shackle.

1 9. A disc shaped padlock comprising:
2 a disc shaped body member forming an external notch extending radially
3 through the circumference of said body member and having a width sufficient to receive
4 elements to be locked;

5 an annular groove formed within and at the circumference of said body
6 member;

7 a shackle disposed in said groove of said body member for movement in
8 an annular path in said internal groove, said shackle being in the form of an open ring
9 having a gap at least equal to the width of said external notch, said shackle being in an
10 unlocked position when said gap and said notch are in alignment with each other and a
11 locked position when said shackle has a portion closing said external notch; and

12 first and second bearings positioned in the surface of said shackle at first
13 and second locations, respectively, for engagement with the surface of said internal
14 groove, said first location being spaced from said one end of said gap in said shackle a
15 distance greater than the width of said extended notch and said second location being
16 diametrically opposed to said first location, said first and second locations being disposed
17 within said housing during movement of said shackle between said locked and unlocked
18 positions.

1 10. The disc shaped padlock of claim 9 wherein said first and second bearings are
2 ball bearings.

1 11. The disc shaped padlock of claim 10 wherein said ball bearings are disposed
2 in pairs at said first and second locations.

1 12. The disc shaped padlock of claim 9 wherein said first and second locations
2 remain within said body member during movement between locked and unlocked
3 positions of said shackle.

1 13. The disc shaped padlock of claim 9 wherein said first position is formed in
2 said shackle adjacent in spaced relation to one end of said gap a distance greater than the
3 width of said external notch and said second location as positioned in said shackle
4 diametrically opposite from said first location.

1 14. The disc shaped padlock of claim 9 wherein said bearings are disposed in
2 pairs with each bearing of each pair being disposed in a radially outer circumferential
3 surface of said shackle to engage the inner surface of said internal groove and limit lateral
4 movement of said shackle relative to said groove.

1 15. The disc shaped padlock of claim 9 wherein a lock-engaging notch is formed
2 in said shackle between said first and said second locations and diametrically opposed to
3 said gap.

1 16. The disc shaped padlock of claim 15 wherein both said first and second
2 locations are within said body member in said locked and unlocked positions of said
3 shackle.

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